

Notes on the Flagellata of Hongkong.

by

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1. Species of the genus *Chlorogonium* Ehr. (Chlorophyceae, Volvocales, Chlamydomonadaceae) from polluted waters in Hong Kong.

Notulae ad floram Flagellatarum Hongkongensis 1. Species generi Chlorogonium Ehr., Chlorophyceae, Volvocales, Chlamydomonadaceae in Hongkong aquae impurae inventae cum 8 fig.

Abstract

In the present note the author describes 7 species of the genus *Chlorogonium* Ehr. from polluted waters of Hong Kong, recorded from materials received in January 1966 and studied in the Botanical Institute of Sao Paulo, Brazil. The collection from Hong Kong has been received through the kindness of Professor Thomas B. Widdowson of the Botanical Department of Hong Kong University. Samples of mud cultured in glass vessels were collected in Hong Kong by Mr. S. T. Chan of the Botanical Department of the University.

Preface.

Green flagellata of the genus *Chlorogonium* Ehr. form a typical algal component of polluted waters. The genus was proposed by Ehrenberg in 1830 to cover such forms. Cells of *Chlorogonium* are almost fusiform in shape and have 2 flagella at the anterior part of the cell. The chloroplast is entire, massive, green and not laminate in the specimens from Hong Kong. According to the species, the chloroplast contains one, two, or several pyrenoids or may lack them entirely. The nucleus is almost centrally located. Some species have an eyespot, while others lack one. Asexual reproduction is by transverse division of the protoplast and by the production of zoospores. Sexual reproduction is by fusion in pairs of equal sized (isogamous) biflagellate gametes.

Seven species of *Chlorogonium* are recorded from the cultures of polluted mud collected near Hong Kong. One has been identified as *Chlorogonium euchlorum* Ehr., but the remaining appear to be new to science and are so designated.

Key to the Species.

A. A single pyrenoid present.

a. Eyespot present, cell fusiform , ... 1. *Chlorogonium chanii*
sp. nov.

b. Eyespot lacking, cell fusiform ...

1. Pyrenoid central.

2. *Chlorogonium astigmatae*
sp. nov.

2. Pyrenoid posterior (rarely 2) 3. *Chlorogonium subtropicale*
sp. nov.

- B. Two pyrenoids present.
- a. Eyespot lacking ... 4. *Chlorogonium widdowsoni* sp. nov.
 - b. Eyespot present, apical and very small ... 5. *Chlorogonium aberdeenii* sp. nov.
- C. Numerous pyrenoids.
- a. Eyespot lacking ... 6. *Chlorogonium stentoni* sp. nov.
 - b. Eyespot present ... 7. *Chlorogonium euchlorum* Ehr.

1. ***Chlorogonium chanii* sp. nov.** [Fig. I: 1.]

Cellula brevi vel longi-fusiformis cum apicibus attenuatis et cum flagella $\frac{1}{2}$ -plo cellulae paulo longiore; chromatophoris parietalis; stigma elongatum prope vacuolae parte anteriore cellulae; pyrenoide centralis prope nucleus; cellulae $9-15 \times 4 \mu$. Differt a *Chlorogonium fusiforme* Matv. in stigmatate fere apicale. Dedicavi hanc species in honorem Do. S. T. Chan collectoris algarum Hongkongensis. Hab. Hong Kong, in orysetis cum aqua impura, lg. S. T. Chan, 12th August, 1965.

2. ***Chlorogonium astigmatae* sp. nov.** [Fig. I: 2.]

Cellula brevi-fusiformis cum apicibus brevi acutis, lateribus plusminusve rotundatis; flagella $2\frac{2}{3}$ -plo cellulae longioribus; stigmatate nullo; pyrenoide et nucleus centrales; vacuola parte anteriore prope flagellis; cellula $9-14 \times 4-5 \mu$. Differt a *Chlorogonium obliquum* Skv. 1946, *Ch. uinutum* Skv. 1957, *Ch. leiostracum* Str. et *Ch. tetragamum* Bohl in stigmatate nullum. Hab. Hong Kong, in rivularis et orysetis cum aquae impurae, lg. S. T. Chan, 12th August, 1965.

3. ***Chlorogonium subtropicale* sp. nov.** [Fig. I: 3 & 4.]

Cellulae fusiformis cum apicibus attenuatis et acutis; flagella 2, apice, $\frac{3}{4}$ -plo cellulae longioribus; vacuola contractilis pone; nucleus centralis; pyrenoide 1 rarior 2, inter nucleus et parte posteriore cellulae; cellulae $18-30 \times 7.4 \mu$. Differt per totem species in 1-2 pyrenoidibus. Hab. Hong Kong, in rivularis montanis cum aqua impura, lg. S. T. Chan, 12th August, 1965.

4. ***Chlorogonium widdowsonii* sp. nov.** [Fig. I: 5.]

Cellula perfecte lanceolata vel spatulata cum parte posteriore late cuneata; flagella $2\frac{2}{3}$ -plo cellulae longiora; nucleus centralis; stigmatate nullo; pyrenoide 2; cellulae $14-18 \times 7.4 \mu$. Differt a *Chlorogonium aculeatum* (Korsch.) Pascher, *Ch. acuminatum* Skv. 1957, *Ch. elongatum* Dang., in stigmatate nullo. Dedicavi hanc species in honorem Dom. Prof. Thomas B. Widdowson, Botan. Depart. Hong Kong University. Hab. Hong Kong, in rivularis montalis cum aquae impurae, lg. S. T. Chan, 12th August, 1965.

5. ***Chlorogonium aberdeenii* sp. nov.** [Fig I: 6.]

Cellula fusiformis cum apicibus attenuatis et acutis, parte mediane cellulae cum lateribus conversis; flagella 2, 4-plo cellulae paulo brevioribus; stigma minor fere apice; nucleus centralis; vacuoles contractiles nonnihil; cauda hyalina sine chromatophoris. Differt a *Chlorogonium elongatum* Dang. in stigmatate mintae

apicale et in margines cellulae protractis. Hab. Hong Kong, prope Aberdeen, in rivularis montanis cum aqua impura, lg. S. T. Chan, 12th August, 1965.

6. **Chlorogonium stentoni** sp. nov. [Fig. I: 7.]

Cellulae elongato-fusiformis cum apicibus elongatis et protractis; flagella 4–5-plo cellulae brevior; stigma nullo; nucleus fere centralis; pyrenoide 5–10; cellulae $37\text{--}74 \times 9\text{--}5 \mu$. Differt a *Chlorogonium euchlorum* Ehr. (see Pascher 1927, p. 314–315, fig. 281–282) in cellulis astigmatiis. Dedico hanc species in memoriam Dom Prof. O. H. Stentoni Universitatis Hongkongensis Hab. Hong Kong, Aberdeen, in rivularis montanis cum aquae impurae, lg. S. T. Chan, 12th August, 1965.

7. **Chlorogonium euchlorum** Ehr. [Fig. I: 8.]

Cells lanceolate and acute at both ends. Flagella 2, about $\frac{1}{3}$ the length of the cell. Chromatophores in the form of a green plate close to the periplast. Stigma large, long, in the anterior part of the cell. Pyrenoids 6. Nucleus central and large. Contractile vacuoles small and numerous. Hab. Hong Kong, in a polluted stream, collected by S. T. Chan, 19th August, 1965. Reported from Europe and N. America.

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1. The first of the year was a very cold day, with a heavy frost, and a strong wind from the north. The snow was very deep, and the roads were very slippery. The weather was very disagreeable, and the day was very dull.

2. The second of the year was a very cold day, with a heavy frost, and a strong wind from the north. The snow was very deep, and the roads were very slippery. The weather was very disagreeable, and the day was very dull.

3. The third of the year was a very cold day, with a heavy frost, and a strong wind from the north. The snow was very deep, and the roads were very slippery. The weather was very disagreeable, and the day was very dull.

4. The fourth of the year was a very cold day, with a heavy frost, and a strong wind from the north. The snow was very deep, and the roads were very slippery. The weather was very disagreeable, and the day was very dull.

5. The fifth of the year was a very cold day, with a heavy frost, and a strong wind from the north. The snow was very deep, and the roads were very slippery. The weather was very disagreeable, and the day was very dull.

6. The sixth of the year was a very cold day, with a heavy frost, and a strong wind from the north. The snow was very deep, and the roads were very slippery. The weather was very disagreeable, and the day was very dull.

7. The seventh of the year was a very cold day, with a heavy frost, and a strong wind from the north. The snow was very deep, and the roads were very slippery. The weather was very disagreeable, and the day was very dull.

8. The eighth of the year was a very cold day, with a heavy frost, and a strong wind from the north. The snow was very deep, and the roads were very slippery. The weather was very disagreeable, and the day was very dull.

9. The ninth of the year was a very cold day, with a heavy frost, and a strong wind from the north. The snow was very deep, and the roads were very slippery. The weather was very disagreeable, and the day was very dull.

10. The tenth of the year was a very cold day, with a heavy frost, and a strong wind from the north. The snow was very deep, and the roads were very slippery. The weather was very disagreeable, and the day was very dull.

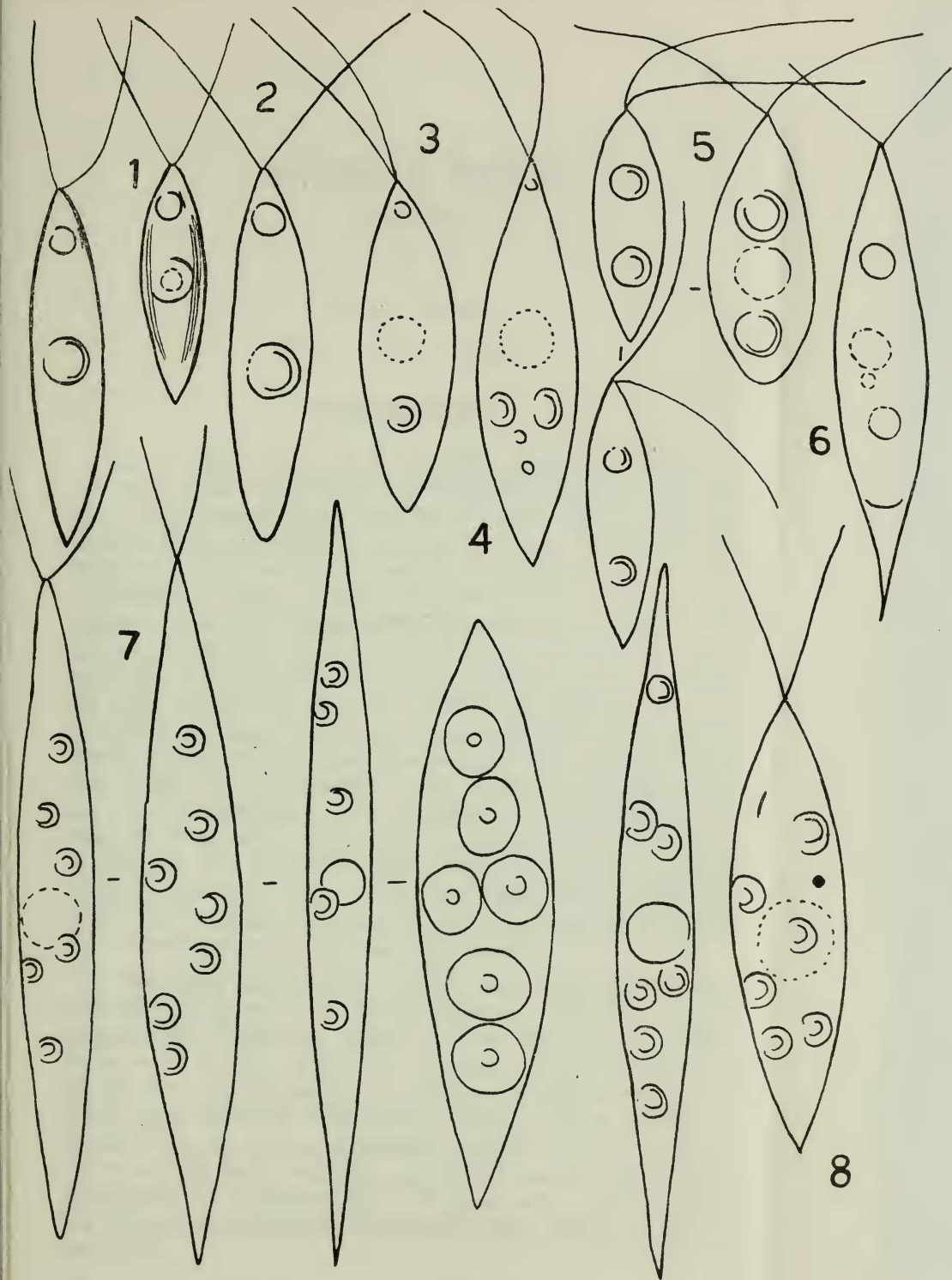


Figure 1

1. *Chlorogonium chanii* sp. nov.
2. *Chlorogonium astigmatae* sp. nov.
- 3 & 4. *Chlorogonium subtropica* sp. nov.
5. *Chlorogonium widdowsonii* sp. nov.
6. *Chlorogonium aberdeenii* sp. nov.
7. *Chlorogonium stentoni* sp. nov.
8. *Chlorogonium euchlorum* Ehr.